NOSTRUM
HIGH PERFORMANCE

Ford Explorer ST & Lincoln Aviator Ethanol Content Module Kit Install Guide

PRODUCT PART SKU#: L087-1378

Warning! Please follow all warnings and instructions found in your vehicle owner's manual. The following instructions must be read and fully understood before beginning installation. Failure to follow these instructions may result in vehicle damage, personal injury, or death. If these instructions are not fully understood, do not attempt installation.

The Nostrum ethanol sensor kit for the 2020+ Ford Explorer ST and Lincoln Aviator is designed to allow you to view and monitor the ethanol content percentage of your fuel. ECU calibration changes are required in order to account for the ethanol content and the resulting change in stoichiometric air fuel ratio. Unlike some other vehicle applications, the OEM Ford Explorer ECU software is not able to accept the ethanol content signal from the sensor directly or from our module so even with ECU calibration changes this sensor kit does not provide true flex fuel capability. You must change your ECU calibration to indicate to the ECU what the ethanol content percentage and stochiometric air fuel rail ratio is for your current ethanol content. If you add fuel and that results in a change in the ethanol content, you must reprogram the ECU to compensate for this new ethanol content. Failure to change the correct target stoichiometric air fuel ratio for your current ethanol content can cause drivability issues, diagnostic codes and/or engine failure. Talk to your tuner about what calibration files should be used with what ethanol content percentages. Also note that higher ethanol percentages require higher fuel to air ratios, requiring more fuel for the same power level. Some ethanol content percentages may be in excess of the GDI injector, GDI pump and/or in-tank electric pump flow capability of your engine.

Required Tools:

- Socket wrench
- 8mm socket
- 10mm socket
- 13mm socket
- Wiper removal tool
- 5mm Allen wrench
- 3/8" Quick Connect Removal Tool
- Fire extinguisher
- Safety glasses
- Service manual

Consumables:

- Absorbent towels
- Disposable rubber gloves

Parts List

Item	Description	Qty	
A036-1371	Explorer ST and Lincoln Navigator E85 Sensor Mounting Bracket	1	ea
A036-1231	E85 Sensor Mounting Bracket Clamp	1	ea
BULK-RS-N50-128	Rubber Strip, 1/2in x 10ft	1.125	in
91287A136	Hex cap bolt, M6-1.0x16mm	2	ea
91828A251	18-8 Stainless Steel M6-1.0 Hex Nut	2	ea
SE1004	Continental E85 Ethanol Content Flex Fuel Sensor, Compact	1	ea
95612A144	Flanged button head screw, SS, M6-1.0x25mm	2	ea
93625A250	Nylon-insert locknut, M6-1.0	2	ea
L176-1358	Low pressure fuel line assembly, 8-3/4" hose length, 3/8" female QC straight to 3/8" female QC 90 deg	1	ea
L176-1357	Low pressure fuel line assembly, 21" hose length, 3/8" female QC 120 deg to 3/8" female QC 120 deg	1	ea
E467-1143	Nostrum ethanol sensor signal interface module (ESSIM)	1	ea
E066-1396	Explorer ST ethanol sensor interface module fuse and relay wire harness	1	ea
E066-1461	Ethanol sensor to Nostrum ethanol interface module harness, 4-3/4" harness length	1	ea
295813	8" Black Zip Tie	6	ea
Install Guide for E467-1143	NHP Install Guide - E467-1143 E85 Flex Fuel Sensor Signal Control Module	1	ea
Install Guide for L087-1378	NHP Install Guide - L087-1378 Ford Explorer St & Licoln Aviator Ethanol Content Module Kit	1	ea

1. Remove the battery cover on the passenger side of the engine bay.

Figure 1

2. Use a 10mm socket to disconnect the negative battery terminal. Ensure the negative ground wire is securely separated from the terminal to prevent any accidental connection.

Figure 2

3. Remove the cap over the windshield wiper drive nut on both wiper arms.

   Note: You will be removing both passenger and driver side windshield wiper arms.

Figure 3

4. Remove the nut holding the windshield wiper in place with a 15mm socket on both wipers.

Figure 4

5. Use the wiper removal tool to pull the wipers off their studs. Place the jaws around the outside of the wiper and secure them, then torque the screw down over the wiper to pull it away from the stud. Take care not to damage splines. A careful slight back and forth movement of wiper arm on transmission spline will release arm from spline without need for wiper removal tool.

Figure 5

6. Remove the cowl cover by removing all plastic fasteners holding the cowl in place. Counterclockwise turning of top of plastic fasteners will allow them to easily be removed.

Figure 6

7. Once all fasteners are removed pull the cowl covers out by gently pulling away from the windshield. Remove passenger side cover before the driver side.

Figure 7

8. Remove the bolts retaining the wiper transmission using an 8mm socket. **(Torque Spec: 7 Nm)**

Figure 8

9. Remove the wiper electrical connector at the back of the wiper actuator.

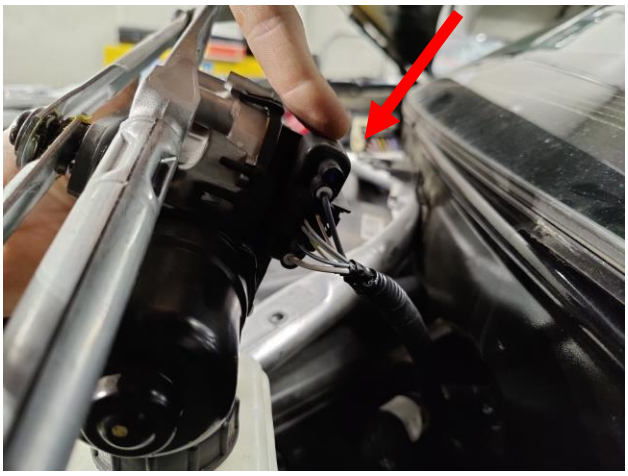

Figure 9

10. Use a 10mm socket to remove the bolts holding the brake fluid reservoir from the brace.

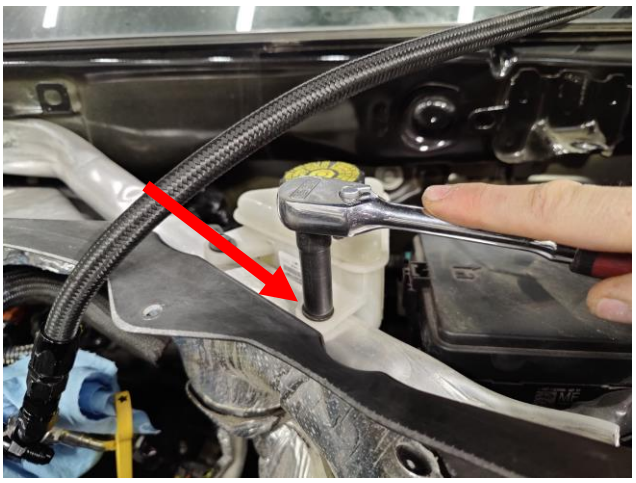

Figure 10

11. Use a 10mm socket to remove the bolt holding the electrical connector bracket in place. Move the wire connector out of the way so the brace can be removed.

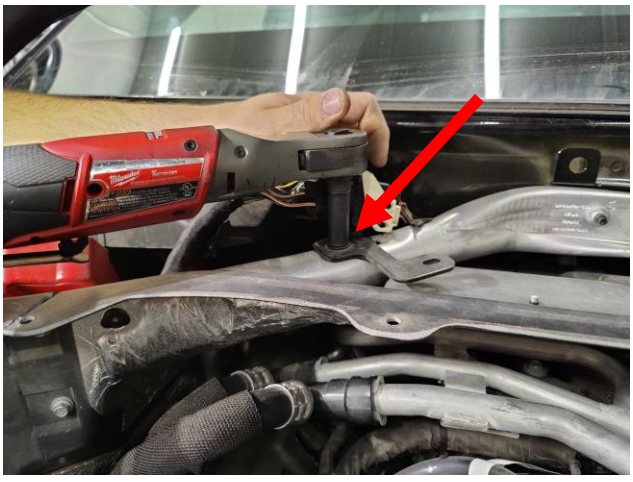

Figure 11

12. Remove both the driver side and passenger side brace using a 13mm socket to remove retainer nuts and bolts.

Figure 12

13. Remove the lower cowl cover by removing the retainment bolts using an 8mm socket.

Figure 13

14. Located at the back of the fire wall is the low-pressure inlet fitting from the fuel tank. Disconnect the stock low pressure line from the inlet fitting. Use a quick connect removal tool to disconnect the low-pressure line from the hard line leading to the high-pressure fuel pump. Remove the stock fuel line from the engine bay. Use absorbent towels when disconnecting the lines.

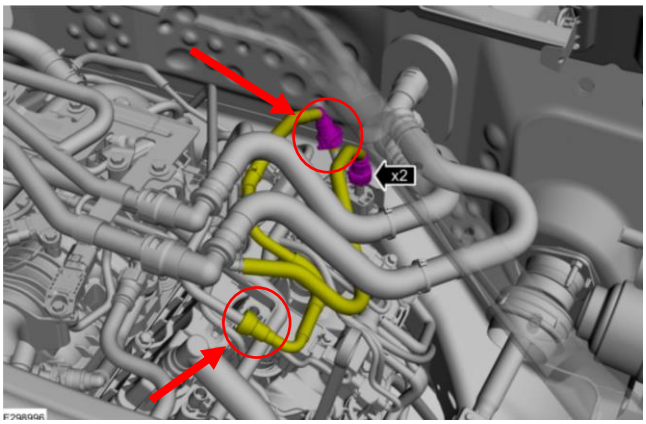

Figure 14

15. Locate the provided *Low pressure fuel line assembly, 21" hose length, 3/8" female QC 120 deg to 3/8" female QC 120 deg* part #: L176-1357-2 that will be connected from the low-pressure fuel feed coming out of the firewall to the Nostrum ethanol sensor.

Figure 15

16. Feed either end of the fuel line underneath the coolant lines and vacuum hoses on the driver's side of the throttle body. This area to feed the tube is between the intake manifold and the driver side cylinder head.

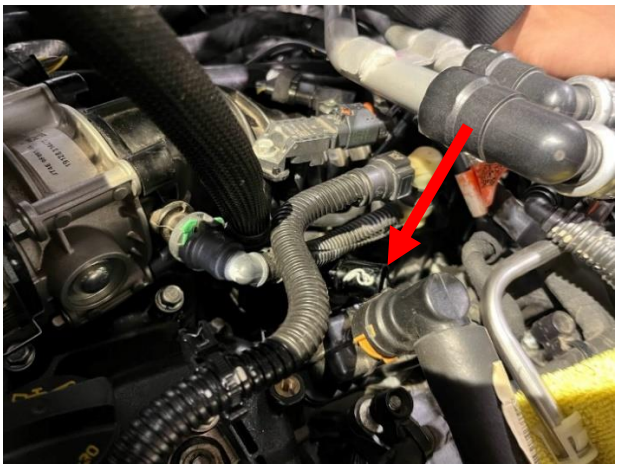

Figure 16

17. Reach around the back of the engine to pull the fuel line through the gap between the intake manifold and the driver side cylinder head.

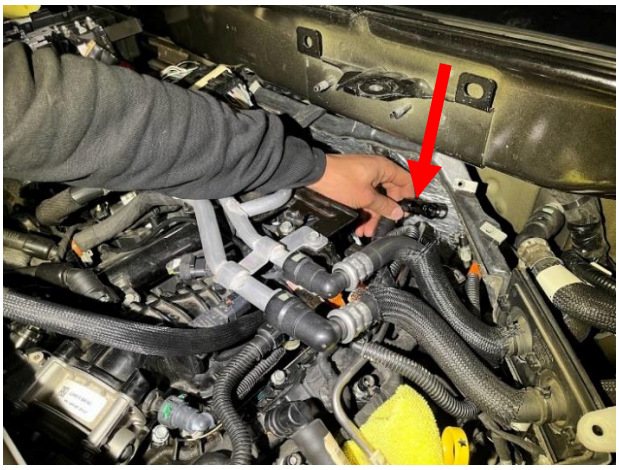

Figure 17

18. Connect the female quick connect to the male quick connect inlet fitting leading to the fuel tank. Ensure that nothing sharp runs near the new low-pressure fuel line.

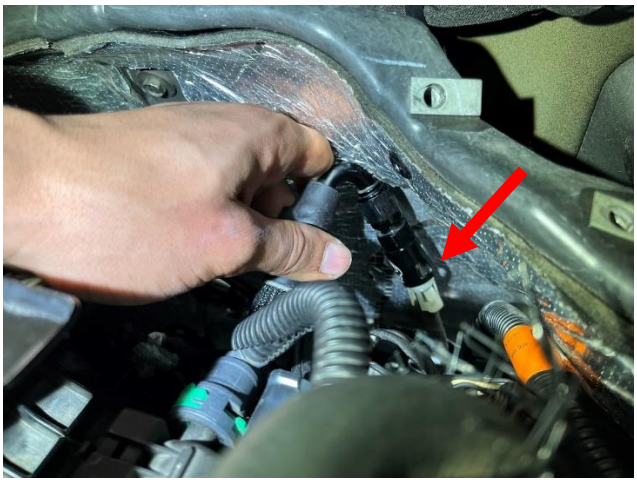

Figure 18

19. Once the low-pressure line is connected reinstall the entire wiper cowl except plastic retaining clips. Do this by following steps 3-13 in reverse order.

Figure 19

20. Disconnect the wiper cowl fuse box cover on the driver's side of the engine bay.

Figure 20

21. Place *Explorer ST ethanol sensor interface module fuse and relay wire harness* (E066-1396) into the compartment containing the fuse box and wiper fluid reservoir.

Figure 22

22. Now that the retaining clips have been removed pull up on the section of the wiper cowl on the driver side.

Figure 23

23. Feed the coil pack wire harness connector on the *Explorer ST ethanol sensor interface module fuse and relay wire harness* (E066-1396) through the opening created in step 7.

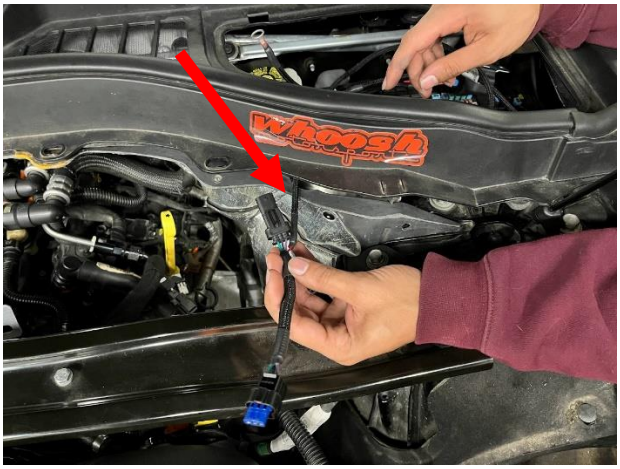

Figure 24

24. Slide locking tab and push the release tab on the coil pack harness connector to disconnect it. This connector is located on the driver side of the engine near the engine oil dip stick.

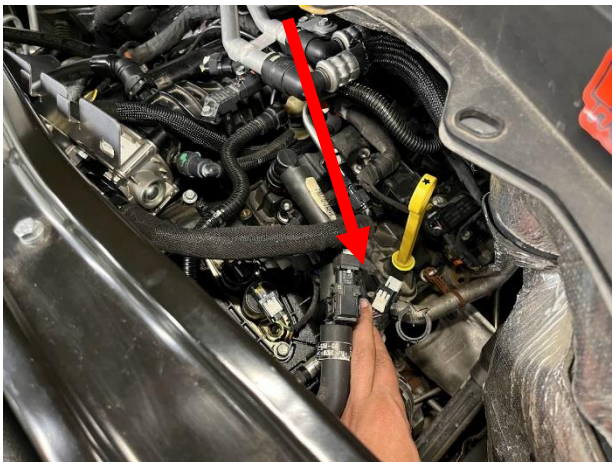

Figure 25

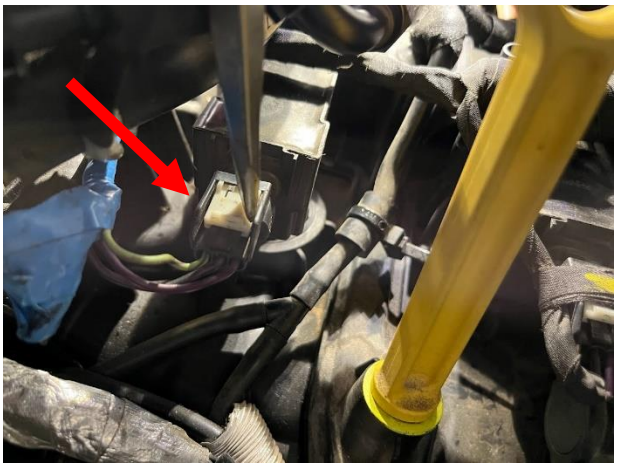

Figure 26

25. Connect the female end of the *Explorer ST ethanol sensor interface module fuse and relay wire harness* (E066-1396) into the vehicle's coil pack wire harness, male connector. Slide the white locking tab back into place.

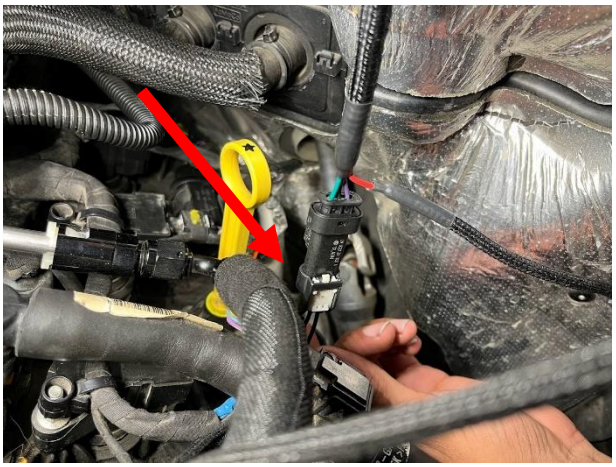

Figure 27

26. Connect the male side coil pack connector on the *Explorer ST ethanol sensor interface module fuse and relay wire harness* (E066-1396) into the female connector on the coil pack itself. (Where the stock coil pack connector was removed)

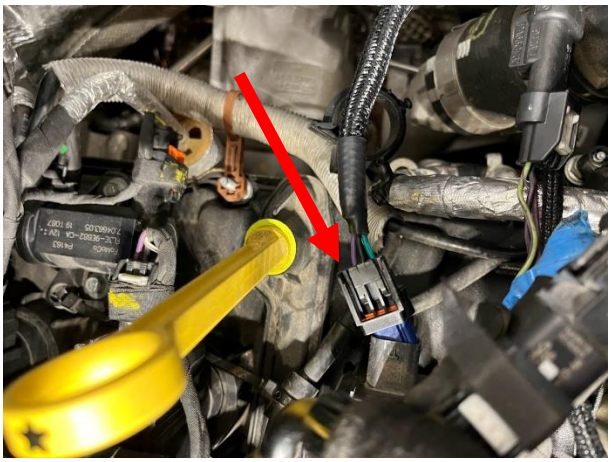

Figure 28

27. Use the 3 clips on the fuse box to remove the fuse box cover.

Figure 29

28. On the *Explorer ST ethanol sensor interface module fuse and relay wire harness* (E066-1396) use the ring terminal with the red wire exposed at the base of the relay box to connect to the power terminal on the fuse box.

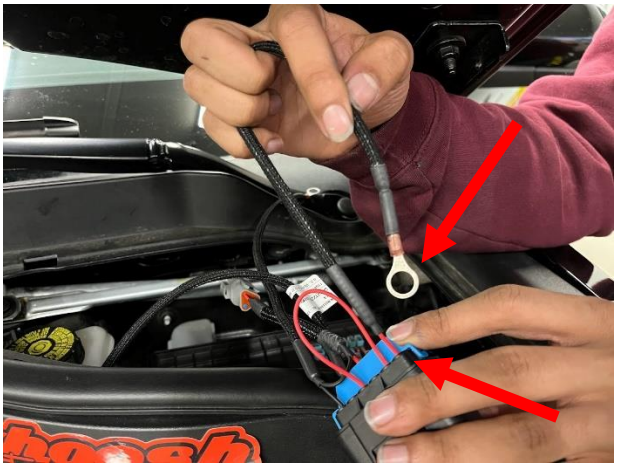

Figure 30

29. Place the red wire ring terminal onto the power terminal on the fuse box. Use a 13mm socket to remove the nut on the power terminal. Place the ring terminal over the stud and reinstall the 13mm nut.

Figure 31

30. Use the ring terminal with the black wire exposed at the base of the relay box to ground the wire harness.

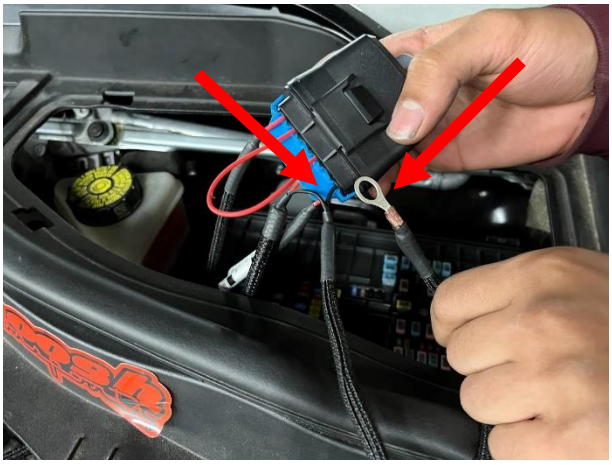

Figure 32

31. Place the ground wire ring terminal on the wiper cowl crossbar bolt using a 13mm socket. (Tighten bolts to factory torque spec) Do not strip crossbar bolts.

Figure 33

32. Place the *Nostrum ethanol sensor signal interface module (ESSIM)* (E467-1143) into the compartment in front of the fuse box. If module is too close to the windshield wiper transmission mechanism wiring damage may occur.

Figure 34

33. Feed connector #3 (The uncapped connector tagged C3 on the wire) on the Nostrum module through the gap in the wiper cowl.

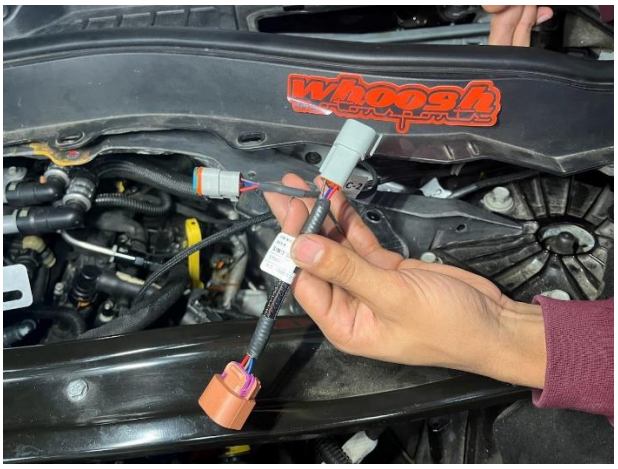

Figure 35

34. Connect the connector 3 from the Nostrum module fed through the wiper cowl cover to the female connector on the E85 sensor adapter (The connector with 3 terminal positions). Match up terminal 1 on the female connector with terminal 1 on the male connector.

Figure 36

35. Next connect the other uncapped connector 4 (tagged C4) on the Nostrum module to the female 3 terminal connector on the E85 sensor wire harness. Match up each connector's terminal 1 on the corresponding connector.

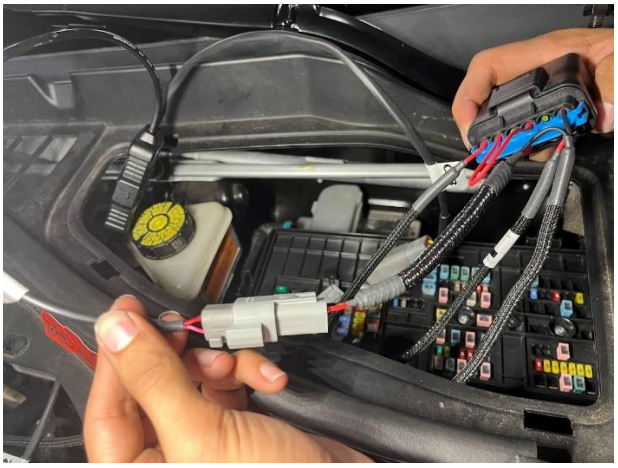

Figure 37

36. Secure the relay box on the wire harness by securing it to the bolt on the brake fluid reservoir using a 10mm socket.

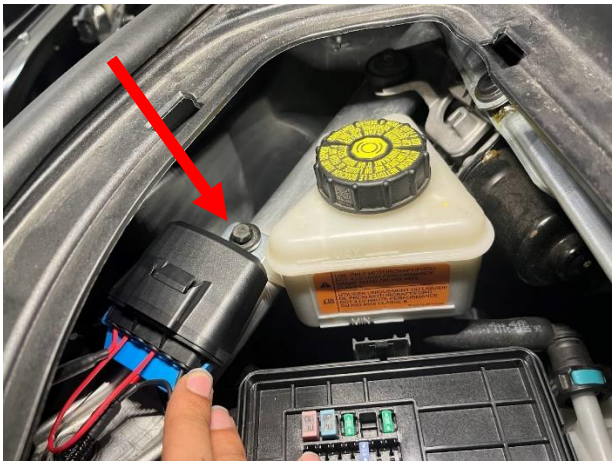

Figure 38

37. Next take out the ethanol sensor and bracket assembly as well as the bolts and locknuts included to secure the bracket to the wiper cowl.

Figure 39

38. Slot the ethanol sensor bracket between the upper wiper cowl trim piece and the lower firewall panel.

Figure 40

39. Secure the bracket in place using the included bolts and locknuts. Use a 5mm Allen wrench and 10mm wrench. Make sure the bolt heads do not pull through plastic holes in the wiper cowl cover.

Figure 41

40. Connect the other end of the longer low-pressure line to the passenger side of the ethanol sensor male quick connect.

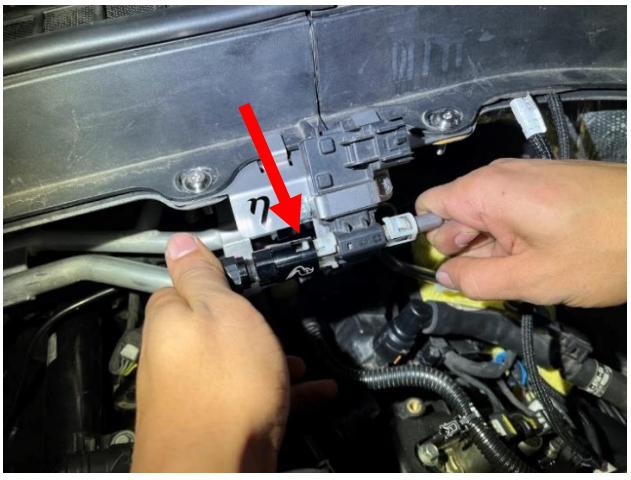

Figure 42

41. The following steps will guide you through the installation of the *Low pressure fuel line assembly, 8-3/4" hose length, 5/16" female QC straight to 3/8" female QC 90 deg* (L176-1358)

Figure 43

42. Connect the 90-degree fitting end of the fuel line to the male quick connect leading to the high-pressure fuel pump. The quick connect is located near the oil dipstick.

Figure 44

43. Connect the other end of the shorter low-pressure line to the driver side male QC on the ethanol sensor.

Figure 45

44. Connect the female connector on the end of the *Ethanol sensor to Nostrum ethanol interface module harness, 4-3/4" harness length* (E066-1461) into the E85 sensor's male connector.

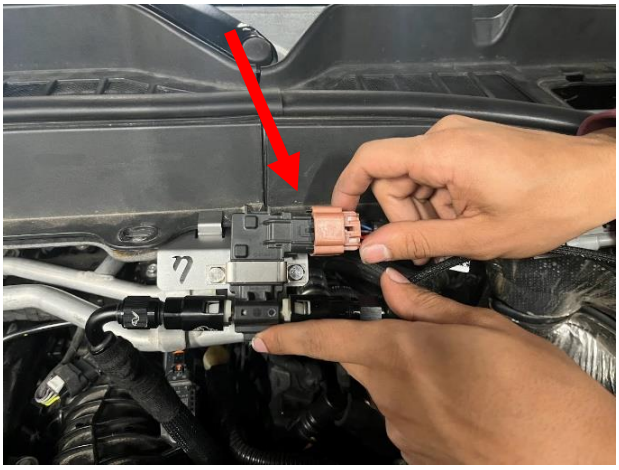

Figure 46

45. Secure the fuse box cover back on top of the fuse box. It should click back into place.

Figure 47

46. Press down the wiper cowl cover lining up the holes for the retainment clips. Push the retainment clips back in place to secure the cover.

Figure 48

47. Zip tie the excess wiring and connectors together to better contain and organize the harness and module.

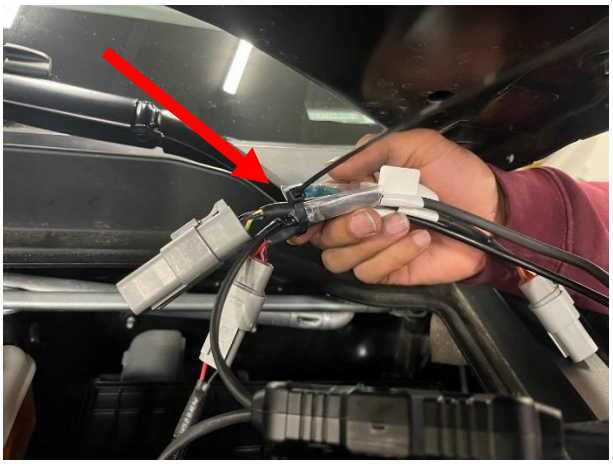

Figure 49

Figure 50

48. Zip tie the coil pack wiring and the E85 sensor connector wiring together to secure them.

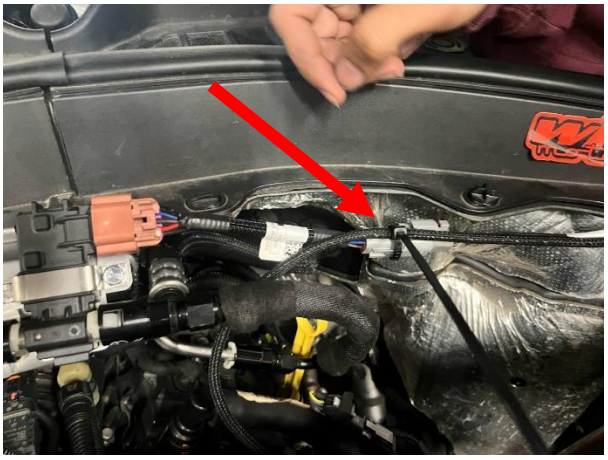

Figure 51

49. Once the zip ties have been secured, reinstallation of all remaining components can begin. Follow the steps of disassembly listed above in reverse to re-install components starting with step 5.

Hardware installation is complete.

Calibration

Do not start your vehicle, this product requires calibration if the ethanol content of your fuel has changed since you installed this ethanol content module kit. If ethanol content hasn't changed you may proceed without a tune. If ethanol content has changed get your vehicle calibrated. Once calibration is complete, please proceed to the next step.

First Start-Up

1. Be sure to remove all installation tools and loose items from the engine compartment. Follow good, safe practices when working on your vehicle. Be sure to reassemble all parts and components according to your OE maintenance manual.

2. Key cycle the vehicle into the "Accessory On" position (do not go to Ignition position). The low- pressure fuel pump with activate and the low-pressure side of the pump will pressurize. Check the high-pressure fuel pump and the low-pressure side for leaks. If ok, proceed to step 3.

3. Key cycle to ignition and let the car attempt several start cycles. Remember that the fuel lines, pump, and part of the fuel rail are filled with air, therefore this step is necessary to evacuate that air and get the system charged. If it starts, OK. If it does not, key off the vehicle. Check the high- pressure lines to the fuel rail, to the pump and the pump itself for leaks. If OK, proceed to step 4.

4. Key cycle one more time all the way to ignition. Engine should start-up and idle. If not, proceed with steps 2-4 again.

5. Let the car idle for a few minutes. Check for leaks on low and high-pressure portions again.

6. Installation is complete!

NOTE: a fault code may appear at the first key cycle due to the long ignition time or the low pressure in the fuel rail, both due to the air in the fuel system.
This code should self-clear after the OEM defined quantity of key cycles.

NOTE: Please check for fuel leaks after driving the car and letting it cool for an extended period of time, fittings may loosen after the first heat cycle due to thermal expansion and contraction. Retighten fittings if needed.

For additional technical & software support please contact:

Email: support@nostrumshop.com
Phone: 734-548-8677 (during normal business hours)

Revision	Notes	Date
Rev 1	Prototype Release	12/7/22
Rev 2	Production Release	1/23/23
Rev 3	Added Calibration Details	2/16/23
Rev 4	Updated Steps & Added Details	6/1/23